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Flood Control and the Growth Machine in Des Moines

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by Julian Hyde

Introduction

How does society respond to natural disasters in urban areas? And who makes these decisions? What happens to a city during a disaster is largely a function of the situation there beforehand. Natural disasters are often called acts of god, but in many ways they are the product of human decisions. How much property is destroyed and how many people die are the results of human decisions, as is what property is destroyed and which people die. How we deal with natural disasters is likely to become especially pertinent in the near future as global warming increases the risks of dramatic weather events. This is particularly true for flooding, the specific type of disaster considered in this paper (IPCC, 1996). The Intergovernmental Panel on Climate Change has said that "there is now mounting evidence to suggest that a warmer climate will be one in which the hydrological cycle will in general be more intense, leading to more heavy rain events" (IPCC 1996a, p. 335). Therefore a solid understanding of how we deal with natural disasters is important for dealing with the challenges of the future.

This paper is an analysis of how the United States Army Corp of Engineers (USACE) has effected flood mitigation in the city of Des Moines, Iowa. Mitigations covers those elements of disaster response that are put in place before a flood in order to reduce damage during the disaster. Des Moines was chosen because it is a city where we can see a well developed flood control system at work. There have been floods in Des

Moines all the way back to the year that it was incorporated as a city, so Des Moines is a city where the flood control system is well developed. Des Moines is not unique in this quality but not being unique means that there will be not anything particularly unusual about the local flood control system. This allows Des Moines to serve as an model for the processes and actors that are important for flood response specifically and disaster response generally in American cities. The USACE will be specifically highlighted due to the level of their involvement with Des Moines' flood control infrastructure.

This paper's will argue that flood control projects created and managed by the USACE are built to benefit a coalition of local landowners and elites. This group is known as the growth machine and it's goal is to create profit by ensuring ongoing population and economic growth (Logan & Molotch, 1988). The development of flood control projects is an extension of those activities. Flood control is a notable example of the growth machine's activities because it is an arena where the federal government intervenes to their benefit. This is an extension of Logan and Molotch's original theory and explains why flood control projects are developed the way that they are. The rest of this paper will go over how the growth machine interacts with both flood control and the USACE.

Theoretical Framework

This paper explores how flood control effects Des Moines. This will involve an approach to flooding that views floods not as external forces that disrupt society but instead as products of society (Parker, 2000). This is the "disaster as social vulnerability" perspective, the idea that floods are a social phenomenon (Flint and Ludoff, 2005). Where a flood happens, when it happens, and how people respond and react to it are all the results of choices made by society. One way to understand this approach is to say that while floods will happen regardless of human interventions, they only become disasters because of human presences. Changes in damage from floods over the years may have more to do with growth in an area than it does with changes in flood patterns. For this reason I will be discussing the environmental or metrological causes of flooding only a very small amount; most of the my focus will be on how people have shaped floods in Des Moines.

This means that I will be primarily focused on decisions made by human actors and organizations involved in flooding. The theoretical framework that I will be applying to understand these choices and actions is the political economy of place. In short, political economy is the theory that actions in the market are not just the result of economic forces, but also of a combination of political and social forces. When applied to the built environment, this means that what gets built is not just the result of the market system. Instead the interactions of many actors and structures combine to produce our built environment. Only by considering the ways that these varieties of components work together or oppose each other can we understand the way in which places develop. For example, it is not enough just to look at what Des Moines has built to deal with floods; you also have to consider who built these projects, who maintains them, and what forces were responsible for their construction.

The political economy framework that I will be using for this paper draws heavily from the book “Urban Fortunes” by John Logan and Harvey Molotch. There are two concepts from this book to which I would like to draw particular attention. First, Logan and Molotch make a point that land is a very unusual commodity. The value of a piece of land is strongly affected by outside factors, often beyond the control of the owners (Logan and Molotch, 1988). The risk of flooding is one of these factors. The likelihood that a piece of land will be flooded is a function of hydrological systems much larger than any plot. If you want to affect that risk, you'll have to operate over an area larger than your particular plot of land.

The second concept is the growth machine, which is a direct outgrowth of the unusual characteristics of land as a commodity. In order to protect and increase the value of a given piece of land, developers and other interests come together to influence the political system in their favor. The main goal of the growth machine is to promote value free growth. Value free growth is growth that is concerned only with making land more valuable on the open market (which is to say the exchange value of the property). It is unbounded by government regulation and makes no consideration of the characteristic of the growth (which is to say the use value of the property). The growth machine seek to organize urban areas into patterns that encourage economic growth and to create a good environment for business. Major players in the growth machine include local politicians, utilities, and the local media, as all of these groups benefit when the population of an era grows (utilities get more customers, local media gets more subscribers, etc). Less important but still vital members of the growth machine are groups such as universities, sports teams, or local labor unions. These organizations come together and collectively manipulate municipal governments in order to achieve a situation which conducive for value free growth. The growth machines is a powerful presence in the modern American city, to the extent that Logan and Molotch argue that they are for all practical purposes synonymous with local government. The growth machine has significant power and influence over the nature of modern cities (Logan and Molotch, 1988).

However, the major actors in a situation is only half of the equation. We also have to understand the context in which these actors are operating. I will be using structuration theory to help explain the relationship between the actors and the various important legal, economic, or social structures. Structuration theory is an attempt to make a middle ground between structuralism, which tries to understand all events in the terms of the structures that control and constrain them, and humanism, which put a strong emphasis on human agency and the ability of individuals to surpass and alter existing structures. Structuration theory works to explain how social structures both influence and are influenced by human behaviors. It posits that while all human activities are defined by social structures, they are also entirely created by humans. Social structures are the medium of human activities but they are also the outcome of human activies, People both effect and are effected by the structures which define their situation. For this reason it is possible for individuals, especially individuals who are knowledgeable about the way the structures work, to alter the structure. In this way, both the actors and the structures have the ability to influence each other.

The final major theoretical addition to the political economy used in my project is a consideration of the role of scale. When considering flooding, there are variety of important scales, ranging from the city of Des Moines to the United States as a whole. The scale at which an actor acts somewhat defines their abilities and goals, but actors also have the ability to jump scales. The ways in which a large scale organization can end up effecting the local scale are obvious, but it is equally true that a neighborhood organization could, at times, affect policy and events at a city, county, state, or national level. Furthermore, it is worth remembering that individuals and institutions do not always act on the same scale that they exist at. It is useful to draw the distinction between what Kevin Cox calls a space of dependence, which are where an actors receives the things that they require, and the space of engagement, which is where actors can exert political emphasis. Actors exert power in their space of engagement in order to protect their space of dependence and these two spaces often exist at different scales. These issues of scale help to explain the nature of actors within the political economy framework.

Data Sources

Information about the flood mitigation projects in Des Moines has been largely taken from government websites and reports. Since these projects are built and run by the government, information about them was available from government sources. The USACE publishes feasibility reports and presentations for their upcoming projects and data about existing projects online for the general public. These reports have been invaluable for seeing the processes and considerations that go into making the physical protections around Des Moines. Information about flood control in general is drawn from textbooks and some academic sources. These have been used to provide important context to the issues that surround flood control.

Urban Flooding

Issues of flooding are not minor ones. Floods are the world's most common form of natural disaster, the third most deadly (Parker, 2000), and floods cause an average of 6 billion dollars in damage and kill around 140 people yearly in the United States. There are hardly any places in the United States that have not suffered at least one flood related disaster in the last fifty years, and most of the Midwest has seen more than three. Floods are the only natural hazard for which the federal government intervenes to provide insurance (USGS, 2006). Between the 1970s and the 1990s the average annual economic damage from floods has doubled (Pielke et al, 2000) indicating that floods and how we respond to them an issue of ongoing importance in the United States. In the following section I will provide some background on the physical geography of floods and the methods that are used to protect against them.

The area around a river that is subject to flooding is known as the floodplain. There are around 3800 cities and towns built on floodplains in the United states (Miller and Miller, 2000) and in the United States today areas on floodplains continue to grow at twice the national average (Montz, 2000). Floodplains have some of the highest population densities in the world (Miller and Miller, 2000) and This is because floodplains are attractive locations for development. The land is flat, making construction and transportation easy, and proximity to a river allows for easy shipping(Miller and Miller, 2000). All these benefits are the results of floods, for it is the floods that flatten out the land and bring in the rich soil. The same thing that makes these areas attractive for development is what makes them dangerous.

To compound the danger, areas that have been heavily settled are more likely to flood than unsettled areas. Houses and streets are impermeable, channeling more water into the river, and that water gets to the river faster than it would naturally due how smooth paved surfaces are. Urban development around rivers, especially bridges, constrain the flow of water and drainage systems bring rainwater to rivers much faster than it would normally flow. These factors mean that areas which are already at risk of flooding will experience more and greater flooding because of development (Montz, 2000).

Techniques of Flood Management

In order to protect communities on floodplains, a variety of techniques have been developed to prevent floods or to reduce the damage. Responses to floods can be divided into two categories: flood control and flood plain management. Flood control consists of physically altering a river or floodplain in such a way that it reduces the danger of the flood. Flood plain management consists of preventing people from building in the areas that are most prone to flooding or regulating what kind of building can be done there. These two approaches to mitigating flood damage are often in tension with each other. Improvements in flood control techniques or the building of a flood control project will make areas of the flood plain which were previously too dangerous to build on safer, which will reduce the need for management. But floods cannot be entirely controlled, so some areas must always be managed (Miller and Miller, 2000). This paper will focus on flood control rather than flood plain management, so I will not discuss those methods in further detail

Flood control projects come in a variety of forms. Levees are built around a river and increase it’s capacity, functioning as a secondary, artificial river bank higher than the normal one. Reservoirs can be built to capture the extra water from the flood and then release it later, at a slow and safe rate. Flood walls can be built around a settlements, which will prevent the water from entering the settlement. Overflow land can be set aside, where flood waters can be safely channeled without risking damage to settlements.

Diversion channels can be used to create new paths for the flood water to flow in. All of these techniques can be combined in a variety of ways to fit the situation in any given location (Miller and Miller, 2000).

All flood control techniques have limitations. When building a flood control system certain assumptions are be made about how high the flooding will end up going and if that amount is surpassed, the results are often worse than the situation would be without any form of flood control. For example, if levees are topped or break, all of the water stored in them will rush into the city at once. If water goes over a flood wall, the wall can prevent the water from draining back out again, turning the city into a lake (Miller and Miller, 2000). Additionally, many flood control projects do not so much prevent floods as move them. One area may be spared the effects of a flood only to have an area downstream suffer a large flood than they would have without the presence of the project. Finally, these projects are expensive to build and many times disrupt the local river ecosystem (Samet, 2000). No flood control technique can entirely prevent floods and they are never without consequences

There are also the economic effects of flood control projects. Locations where there is some form of protection are safer investments than those without them, and protected areas have higher land values than those that are unprotected. This fact, in combination with the variety of positives that floodplains have for development discussed earlier, means that once a flood control project is built in a location, development will increase there. Increased development brings an increased population, which in turn creates a demand for more flood control. This process is reinforced by the fact that the people who benefit from flood control projects (local land interests) are not the ones who are paying for (largely the federal government). This dynamic has lead to the flourishing of flood control projects across the United States. In particular, the number of levees built has been growing rapidly, in what has been called a "levee love affair" (Montz, 1995) or the "levee effect."(Smith, 2004).

Flooding and Des Moines

Flooding has long been a presence in Des Moines. Located on the confluence of the Des Moines and Raccoon rivers, Des Moines was first established in 1843 with the building of Fort Des Moines (Pratt, 1972). The fort was abandoned three years later, but settlers continued to move into the area and in 1846 it was made the seat of Polk County. The first major flood in Des Moines came in May of 1851, which wiped away much of the early town. The same year as the flood Des Moines was formally incorporated as a city and made the capital of Iowa. Des Moines suffered a major flood every 3 to 11 years between 1851 and 1903 and was also flooded in 1902, 1903, 1947, 1965, and 1969 (Corps, 2005). Iowa suffered more flood damage in the second half of the twentieth century than any other state in the union (Pielke et al, 2000) and as the largest city in the state, Des Moines felt the effects of much of that damage.

Des Moines and Nearby Rivers

The most recent flooding is Des Moines includes the Great Flood of 1993 and another large flood in June of 2008. The Great Flood of 1993 covered large portions of the Midwest and was the costliest river-related flood in history, with the total costs being over 20 million dollars (USGS, 2006). In Des Moines, the local Water Treatment facility was flooded when the Raccoon River overflowed, preventing inhabitants of the city from getting running water for 11 days and potable water for seven more after water pressure returned. The city suffered over 152 million dollars in damages with more than three thousand properties effected (Corps, 2005). Although the 2008 flood, in which the Birdland Levee breached, did not reach that level of devastation, it still necessitated the evacuation of 270 homes (Fox, 2008). From the very earliest days right up the recent past, floods have been a presence in Des Moines.

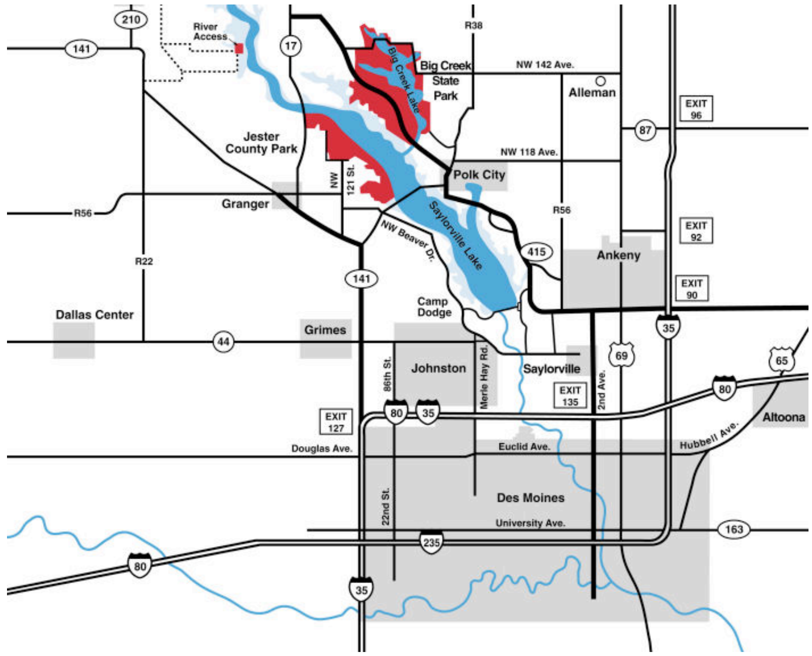
The Des Moines and Raccoon Rivers drain more than ten thousand square miles of land (Corps, 2005) spread out over Minnesota, Iowa, and Missouri. The headwaters of the Des Moines river are located at an elevation of about 1,900 feet above sea level, while Des Moines is at 955 feet. Floods in Iowa are not constrained to a specific season, as they can happen in the early spring because of the snow melt and in the summer or fall due to heavy rain. There are also occasional flash floods, caused by intense rainfall in a short period, usually around May-September (Pielke et al, 2000). These are the physical geography features which come to together to make Des Moines prone to flooding. It is within these constraints that any flood mitigation project must function.

Flood Mitigation Techniques Found in Des Moines

As would be expected, all of this flooding has occurred without a response. Over the years flood control infrastructure has been installed in Des Moines and along the Des Moines and Raccoon rivers. I will be looking in depth at a two aspects of Des Moines' flood control infrastructure: the levees within Des Moines and the Saylorville dam. In addition to describing them, I will explain their history and elaborate about who controls, manages, and maintains these projects.

Saylorville Dam and Reservoir

The Saylorville Lake serves as a reservoir, holding extra water from the Des Moines River in case of flooding. Saylorville is an artificial lake, constructed by the US Army Corp of Engineers. The lake dates back to 1944, when the US Senate Committee on Commerce authorized a study to find additional flood protections in response to a flood that year which forced eighteen thousand people from their homes. Nine sites where considered before Saylorville was selected in 1958. Construction began on the project in 1965 and lasted until 1977. A dam on the Raccoon river was also considered during the feasibility study but no economically justifiable areas were able to be found (USACE, 2005).



Saylorville Lake and Des Moines

The first flood where the Saylorville dam was seen in action was in 1984, and it was used again in 1991 and twice in 1993. The Saylorville dam is one of only two USACE dams on the Des Moines river, the other being Lake Red Rock. These two dams were built to work together on flood mitigation, but Lake Red Rock is downstream of Des Moines and as such does not help mitigate their floods.

The Saylorville dam is a earth-filled embankment 6750 feet long, 105 feet tall, and 44 feet wide. It has a 430 foot spillway, made from concrete, that is followed by an earthen channel. The water in the lake can vary from 836 feet above sea level under normal conditions and a hypothetical maximum of 907 feet. It reachs 890 feet when the reservoir is storing water to prevent floods.

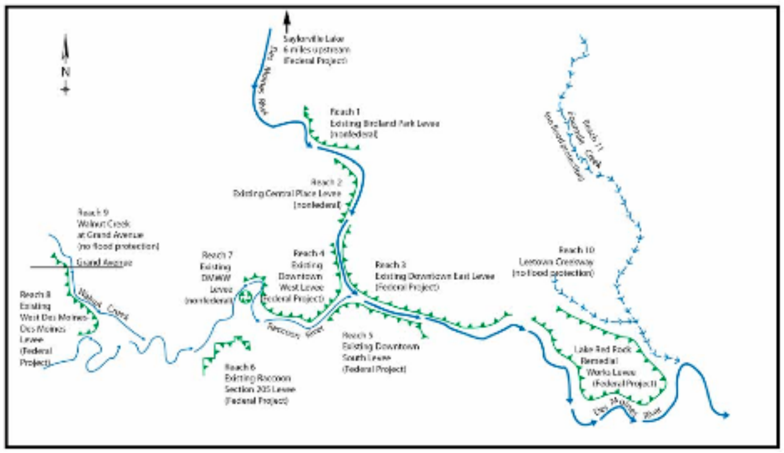
Building the Sayorville dam cost an estimated 130 million dollars and according to the USACE it has prevented an estimated 174 million dollars in property damage to Des Moines, with 113 million dollars saved in the 1993 flood alone. The Saylorville dam is still run and maintained by the USACE. The city must make requests to them in order to alter its flow and ongoing maintenance and management is handled by the USACE. Most of the responsibility regarding this portion of the protection is held by the federal government.

The Saylorville dam falls outside the bounds of Des Moines and as such is a good example of the role that scale plays in the political economy of flood control projects. The city of Des Moines would not have had the authority required to build such a project, since the lake does not fall with its boundaries. But natural phenomenon like floods do not respect political boundaries and events outside Des Moines can cause flooding within it. For the growth machine to increase property values by reducing flood risk, they would need to reach outside their normal political boundaries. A federal organization like the USACE allows them to do this. The growth machine in Des Moines' space of dependence is in and around Des Moines, but their space of engagement is much larger. The growth machine can effect federal policy and as such can make changes outside Des

Moines by using federal organizations to their benefits. This is one of the major ways in which flood control projects can be used to benefit the growth machine.

Levees

There are nine levees in Des Moines. Around the downtown area there is the Birdland Park Levee, the Central Place Levee, and the Downtown East, West, and South Levees, plus the Des Moines Water Works Levee, which only protects that facility from flooding. Other nearby Levees include the Raccoon River Section 205 Levee, the West Des Moines Levee, and the Red Rock Remedial Works Levee. Along the downtown levees there are a series of closures or holes in the levee where traffic can move through, which must be closed in the event of a flood.



Levees In and Around Des Moines

The levees require much more frequent repairs and new construction than the Sayorville dam simply because they are much more likely to break. In June of 2008 the Birdland levee broke and flooded some of Des Moines. However, even before that the USACE had been planning an upgrade to the levee system, having put out a feasibility study in 2005. The study recommended upgrading the Birdland and Central levees and raised concerns about the number of closures in the downtown levees. In total the feasibility study considered fifteen different locations and discusses what, if any, changes should be made.

There are two portions of the feasibility studies which are interesting for our discussion. First, there are the standards that the USACE uses to judge the projects. In the feasibility study a number of plans are generated and compared before a final suggestion is made. These plans are evaluated based on two main factors – the environmental and the economic costs. Both of these were factors in considering which plan they would end up choosing.

Second, the study describes how the costs of the project would be divided. For all USACE projects, the local city pays a minimum of 35% and a maximum of 50% and they would be responsible for upkeep of the project after it was built. The suggested levee improvements would cost a total of $10,491,000, of which the city would have to pay three million, which is about 34% of the total cost, slightly below the minimum amount. This is the point that was previously mentioned about the levee effect – the benefits of the levees are local landowners, but the majority of the cost is being born by federal government.

Major Actors

As mentioned before, floods are natural phenomenon and as such do not respect political boundaries. Therefore there are actors involved with control flood at every governmental level, from the largest to the smallest. At the federal government there is the Army Corp of Engineers (USACE), the Federal Emergency Management Agency (FEMA), and the National Flood Insurance Program, each of which play a role in different portions of the food control system. There are state run programs to buy houses location on flood prone land which are run with government money. At the county level there is Polk County Emergency Management, which is mostly involved in making sure that various involved actors work correctly together. Finally there is the city of Des Moines itself, with which the USACE works directly with when dealing with the levee repairs. All of these levels of government come together in an attempt to deal with the flooding in Des Moines. Of these actors I have selected the USACE for an in-depth analysis due to the scale of their role.

The US Army Corp of Engineers

The Army Corp of Engineers is probably the single organization that is most directly connected with how floods are handled in the United States. They are unquestionably the organization that is most involved with the physical forms of flood mitigation. They manage more than 380 lakes and have built more 8,500 miles of levees and more than 600 dams (Samet, 2007). This level of involvement makes it worthwhile to consider in depth where the USACE came from and how they decide what they will do.

The USACE is divided up into districts, each handling a different portion of the United States. Des Moines is covered by the Rock Island District, which also handles Madison, WI, Springfield IL, and a small portion of Minnesota. Rock Island District is in turn part of the larger North Central district, which covers all of Minnesota, the area around the Great Lakes (all of Michigan and the western coast of New England, including Buffalo), and most of Iowa. The Corps makes its decisions regarding what and where it will build based on its "Principles and Guidelines" and by doing feasibility studies. The Principles and Guidelines of the Corps is a set of rules which dictates the goals of the USACE and how it will go about achieving those goals. Feasibility studies are an analysis done by the USACE in order to decide what it will do in any given situation (Samet, 2000). These two processes decide the impact that the USACE will have on the built environment of Des Moines and they are the reason the USACE is a natural ally of the growth machine.

The Principles and Guidelines of the Army Corp of Engineers were written in 1983 and they have not been dramatically changed since then. According to the P&G, the USACE is required to chose the project which will produce the greatest economic benefit. While they also consider other effects of their projects, like environmental effects, they are purely secondary concerns (Samet, 2000). This means that the USACE are required by their guiding documents to favor whichever project will most benefit value free growth.

While the Principles and Guidelines decide the general goals for the USACE, feasibility studies are how the USACE decide what they are going to do in any given place. Feasibility studies involve a cost-benefit analysis, to ensure that the costs of a given project do not exceed the benefits accrued. The plan for a given project, the analysis, and an environmental review of the project are all presented to the Committee on Commerce, Science, and Transportation, which then decides if the project is to be authorized. The suggestions, as they appear in the feasibility report, do not always perfectly reflect the final project, because of changes that may be made in order to get them approved by congress (Samet, 2000). The most common methodological tool use to judge a project in these studies is an analysis of the economic cost, which also aligns the mission of the USACE with the idea of value free growth. All of these steps come together to decide how the USACE will impact on the built environment in cities across the United States.

This alignment of the USACE with the ideology of value free growth is not surprising when you look at their history, which Karen M. O'Neil describes in "Rivers by Design." O'Neill lays out a history of the how the central government has intervened in rivers across the United States over a period stretching from before the Civil War to 1937, when the Flood Control Act was passed. In her book she shows that the level of intervention into rivers and floodplains by the federal government has slowly risen over the years leading to the the current situation where the United States has one of the largest flood control infrastructure of any nation in the world, despite having only a limited amount of land on floodplains. This increase happened, according to O'Neill, not because of the desire of the federal government; in fact, the federal government was rather reluctant to take on these responsibilities.

Instead, this shift was driven by the desires of local and regional elites. These elites desired the flood control projects in order to protect their lands and to help with regional development, by opening up new available land and improving local navigability. Congressional representatives promised to bring federal projects to their area for this purpose, which encouraged the central government's intervention into the rivers. This ongoing process has brought about the current situation of intense government presence in the state of our nation's waterways.

In other words, federal flood control policy has been designed from the earliest days in order to benefit the growth machine. From this perspective, the fact that it still does so today is not surprising. The USACE is defined by a series of structures that require them to continue benefiting the growth machine. The USACE has the explicit goal of encouraging value free growth and the USACE is not a member of the growth machine. They do not particularly benefit from growth in Des Moines, be that growth economic, geographic, or numerical. But their Principles and Guidelines and the nature of their feasibility studies make them act in such a way that consistently benefits the growth machine. These structures make the USACE a natural ally of the growth machine, regardless of their own goals.

But as structuration theory tells us, structures can be changed. For example, in 2009 the Obama administration began a process to update the Principles and Guidelines so that the USACE must consider social and environment effects of their projects as well as economic ones. The intention is include factors such "ecosystem restoration, public safety and watershed management planning" in the planning process and to move beyond only considering economic gains (Luntz, 2009). If these changes were successfully made, it would shift the USACE away from it's historical support of the growth machine and instead align it with the use value of the communities that they effect.

Similarly, feasibility studies can be altered by sufficient public pressure at times. One notable example is the Napa River in California. There a coalition of residents, environmental groups, and local businesses game together to bring an alternative plan to the USACE, one which considered the environmental and aesthetic effects of the project. After negotiations with the USACE, this alternate plan was ultimately adopted. When local communities are able to bring their own plan and to argue for their benefit with the USACE, the results support the use value of these communities and areas rather than their exchange value (Samet, 2007). During the feasibility study for the levees in Des

Moines, the USACE held three public meetings, where it presented the plan in it's current form and invited the general public to comment. At the very least the USACE goes through the motions of getting the public's input in their projects and if the local community gets involved in that process, the results can be changed. The USACE's assistance of the growth machine does not need to be the case– the potential exists for it to be altered when locals get involved with the process.

Conclusion

From what we have seen, Des Moines' flood control happens in such a way as to benefit the growth machine. When building a flood mitigation project, the primary concern is in determining the cost-benefit ratio. Benefit takes the form of damage to property avoided, especially since, thanks to previous flood control efforts, deaths from floods are very rare (the 1993 flood, which was of unprecedented size and damage, killed only seven people). In this way these projects are perfectly aligned with the ideals of value free growth.

Applying both the growth machine and the political economy of place framework to this case is both intuitive and useful. When considering projects of this nature, it is easy to look only at the hydrological and technological details of what is built. But while these are important, approaching the idea from the political economy perspective sheds important light on the reasons why certain options are chosen. One thing I have found in my research is that the many ways in which flood control projects come into being is an under-studied topic, and political economy can continue to be a useful tool for ongoing work in this area.

There are many aspects of flood mitigation which I skipped or touched on only briefly, and flooding is only one of the natural disasters which affect urban areas. Other than floods, urban areas can be effected by earthquakes, hurricanes, landslides, fires, and other less common disasters. Furthermore, there are a variety of kinds of floods, each of which requires a different kinds of responses. As such, there are plenty of projects that could be done about this subject. Comparing the situation between different countries would be a fruitful project, as would comparisons regarding flooding responses to the responses to other kinds of hazards. Des Moines is an example of a city that has river floods, but the political economy of ocean flooding may be different. There are a wide variety of potential topics where this research could be extended.

I would anticipate that the processes I have described in Des Moines is likely generalizable to other situations. Most of the major actors, especially the Army Corp of Engineers, are federal agencies and are therefore likely to perform a similar role in all US cities where they are acting (which, as I have shown in the section on urban flooding, is the vast majority of US cities). Local political situations may cause different outcomes, but the fundamental nature of these federal agencies are constant throughout the nation and their role in the growth machine can be generalized. For disasters other than floods, there will be other actors shaping the responses in each city, so the conclusions made here cannot be so easily generalized for that area. Similarly, outside the United States the situation may be different, as different nations will have different policies towards flood control. But the connection between disaster response and the growth machine is a profitable one and I would not be surprised to see that similar connections have developed for other areas and in other countries. The details may be different, but the fundamental process of the growth machine using disaster response to get resources from a higher level of government will likely reoccur. That process, at least, is likely true in more places than just Des Moines.

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